

## Technical specifications for Required Equipments, Glasswares and Chemicals (2080/81)

| S.N.     | List of items   | Descriptions   |
|----------|---|--|
| <b>1</b> | <b>pH Meter Bench Type</b>  |  |
|          | Display   | large LCD display with backlight   |
|          | pH Range  | 0 to 14.00 pH  |
|          | mV range  | ±1000.0 or more  |
|          | pH Resolution   | ±0.01  |
|          | Accuracy ( @ 25°C )   | ± (0.02pH +2d)   |
|          | Calibration   | Auto calibration for pH7, pH4 and pH 10  |
|          | Temperature Compensation  | Automatic  |
|          | Electrode Diagnostic  | probe condition, response time and out of calibration range  |
|          | Operating Temperature   | 0 to 50°C  |
|          | Temperature Resolution  | 0.1°C  |
|          | Temperature Accuracy  | ±0.2°C   |
|          | Data logging  | 1000 or more   |
|          | Connectivity  | USB  |
|          | Power Supply  | DC 1.5 v or DC 9V adaptor  |
|          | Warranty Period   | 2 year   |
|          | Auto diagnostic for Probe condition, Clean electrode  |  |
|          | Supplied with pH7, pH4 and pH 10 buffers, separate storage solution, Automatic Temperature Probe and electrode holder |  |
|          | Must Submit original Manufacturer Authorization   |  |
| <b>2</b> | <b>Laboratory Electrical Conductivity Meter/TDS Meter (Bench Type)</b>  |  |
|          | Display   | large LCD display with backlight   |
|          | <b>EC</b>   |  |
|          | Range   | 0 to 200µS/2mS/20mS/200mS  |
|          | Resolution  | 0.01 µS/cm; 0.001 mS/cm; 0.01 mS/cm; 0.1 mS/cm   |
|          | Accuracy (@25°C/77°F)   | ±2% of reading ± (0.5 µS or 1 digit, whichever is greater)   |
|          | Calibration   | 1 point offset calibration; 1 point slope calibration in EC standard   |
|          | <b>TDS</b>  |  |
|          | Range   | 0.00 to 14.99 mg/L (ppm); 15.0 to 149.9mg/L(ppm);150 to 1499 mg/L (ppm); 1.50 to 14.99 g/L; 15.0 to 100.0g/L; up to 400.0 g/L (absolute TDS)**, with 0.80 conversion factor. |

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|          | Resolution   | 0.01 mg/L (ppm); 0.1 mg/L (ppm); 1 (ppm) 0.01 g/L; 0.1 g/L (0.8 TDS factor) |
|          | Accuracy (@25°C/77°F)  | ±1% of reading ± (0.03 µS or 1 digit, whichever is greater)                 |
|          | Calibration  | Through EC Calibration  |
|          | <b>Temperature</b>   |   |
|          | Range  | 0 to 50.0°C; 32 to 140.0°F  |
|          | Resolution   | 0.1°C; 0.1°F  |
|          | Accuracy   | ±0.5°C; ±0.9°F  |
|          | Electrode Diagnostic   | probe condition, response time and out of calibration range                 |
|          | Data logging   | 1000  |
|          | Connectivity   | USB   |
|          | Power Supply   | 5 V DC adaptor  |
|          | Warranty Period  | 2 year  |
|          | Auto diagnostic for Probe condition, Clean electrode             |   |
|          | Supplied with 1.413mS conductivity standard and electrode holder |   |
|          | Must Submit original Manufacturer Authorization                  |   |
| <b>3</b> | <b>Digital Turbidity Meter</b>                                   |   |
|          | Principle  | Nephelometric (90° scattered light)   |
|          | Light-source   | IR-LED 860 nm or equivalent   |
|          | Keypad   | Acid and solvent resistant; membrane keypad                                 |
|          | Auto-off   | Automatic Switch-off  |
|          | Display  | Graphic display   |
|          | Update   | Software update via internet  |
|          | Clock  | Real time clock   |
|          | Memory   | 1000 data sets  |
|          | Sample vol.  | at least 10 ml  |
|          | Range  | 0.01-1100 NTU(Auto Range)   |
|          | Resolution   | 0.01 from 0.01-9.99   |
|          |  | 0.1 NTU from 10.0-99.9  |
|          |  | 1 NTU from 100-1100   |
|          | Accuracy   | ± 2% of reading or 0.01 (0-500)± 5% of reading (500-1100)                   |
|          | Interface  | connector for printer and PC connection                                     |
|          | Standard   | Should meet EN ISO 7027 standard  |

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|          | Power Supply  | NiCd rechargeable batteries (type AA); mains adapter(input:100-230V; and lithium battery for data storage   |
|          | Warranty Period   | Two Years   |
|          | Supplied with 5 NTU and 100 NTU Turbidity standard solution |   |
|          | Must Submit original Manufacturer Authorization             |   |
| <b>4</b> | <b>Portable Arsenic Test Device (digital)</b>               |   |
|          | Device  | Range : 2-100 µg/l/ppb<br>Resolution : 0.001 AU or better<br>Timing facility : up to 40 minutes<br>Power : battery Type: Portable and Digital   |
|          | Containing accessories                                      | 1. Tri-filter Arsenic gas trap<br>2. 5 or more x Arsine collection filter holders<br>3. 10 or more x Hydrogen Sulphide removal filters<br>4. required reagents and accesories for at least 400 test<br>5. Color comparison chart (<10 to 500 ppb)<br>6. Dilution tube<br>7. Spare battery<br>8. Waste disposal bags<br>9. tweezers<br>10. Carry case with instruction manual. |
|          | Result availability   | Result should be available within 20 minutes or less  |
|          | Warranty Period   | Two Years   |
|          | Must Submit original Manufacturer Authorization             |   |
| <b>5</b> | <b>Digital Autoclave</b>                                    |   |
|          | Size  | 20 ltr .  |
|          | Gasket  | Neoprene Rubber or better   |
|          | Sterilizing Pressure  | 1.2 Kgf/Cm (15psi) At 121°C   |
|          | Pressure Gauge  | 0-2.1 Kgf /Cm <sup>2</sup> (30 Psi)   |
|          | Operating Pressure  | From 15 - 20psi   |
|          | MOC Pressure Vessel   | Stainless Steel Sheet or better   |
|          | MOC External Wall   | Stainless Steel Sheet or better   |
|          | MOC Lid   | Stainless Steel Sheet or better   |
|          | Basket  | Stainless Steel Sheet or better   |
|          | Accessory   | Pressure Control Switch, Low Water Level Cut Off Device, Digital Timer, Vacuum Breaker  |
|          | Electrical Supply   | 220/230V AC, 50/60Hz  |
|          | Warranty Period   | Two Years   |
|          | Must Submit original Manufacturer Authorization             |   |
| <b>6</b> | <b>Analytical Balance</b>                                   |   |

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|----------|--|---|
|          | Weighing Capacity  | Max.200-250 gms   |
|          | Gram (g)   | 200-250 x 0.0001  |
|          | Linearity  | ±0.0003g  |
|          | Repeatability/Std. Dev.  | 0.0001g   |
|          | Pan size   | Ø90mm   |
|          | Power  | Apporx. 11VA (supplied to the AC adapter)   |
|          | Attachments  | English manual, adaptor, dust guard, clean cloth, brush, tweezers, calibration weight                                 |
|          | One Touch Calibration  |   |
|          | Automatic Self Calibration with internal mass  |   |
|          | Splash Proof Keyboard and Display  |   |
|          | Data Memory Function   |   |
|          | shall be GLP/GMP Compliant   |   |
|          | The system offered shall operate under the normal temperature and humidity                                       |   |
|          | Must provide user training (including how to use and maintain the equipment).                                    |   |
|          | Comprehensive warranty for 2 year.   |   |
|          | The supplier must arrange for the equipment to be installed and commissioned by certified or qualified personnel |   |
|          | User (Operating) manual shall be provided in English   |   |
|          | Must submit ISO 9001:2015 and original manufacturer authorization  |   |
| <b>7</b> | <b>Photometer with Reagents</b>  |   |
|          | Instrument Type  | Dual light source photometer offering direct-reading of preprogrammed test calibrations, Absorbance and Transmittance |
|          | Wavelengths  | 400-650nm or more   |
|          | Accuracy   | ±1.0% T   |
|          | Display  | LCD with backlight and contrast adjustment or better  |
|          | User Interface   | On screen prompts available in English  |
|          | weight   | less than 1 kg  |
|          | Power Supply   | 'AA' batteries , mains power delivered by USB port or adaptor   |
|          | Memory Capacity  | Up to 500 data sets or better   |
|          | IP Rating  | IP 67 or better   |
|          | Test Cuvette   | Automatic centering for cylindrical cuvettes from 13 to 20 mm OD or better  |
|          | Connectivity   | Must have Blue tooth connectivity option with android and USB for data download                                       |

| S.N.  | List of items  | Descriptions   |
|---|--|--|
|   | Accessories Included   | 8 or more cuvette, Dilution tube, Cuvette brush, Stirring rod, Hard carry case, USB port |
| <b>Must be supplied with the below listed Chemicals with an expiry date of minimum 2 years from the date of supply</b>                                  |  |  |
|   | Ammonia reagent  | 300 test   |
|   | Nitrate Reagent  | 300 test   |
|   | Iron reagent   | 300 test   |
|   | Manganese Reagent  | 300 test   |
|   | Fluoride reagent   | 300 test   |
|   | Sulphate reagent   | 300 test   |
|   | Chlorine reagent   | 300 test   |
|   | Aluminium reagent  | 300 test   |
|   | Calcium reagent  | 300 test   |
|   | Total Hardness   | 300 test   |
| <b>8</b>  | <b>Motorized Digital E Burette</b>   |  |
|   | Capacity   | 50 ml  |
|   | Increment  | at least 0.01 ml   |
|   | Display  | digital display of numeric data up to at least second decimal, Touchscreen               |
|   | Screen   | Touch Screen   |
|   | Calibration  | electronically within a laboratory, without the help of an external calibration          |
|   | Connectivity   | USB  |
|   | Accuracy:  | ±% : 0.2, ±ml: 0.1   |
|   | Additional Accessories accessories:  | Stylus, Amber Coloured Window, Adapters, Telescoping inlet tube                          |
|   | Operating Environment  | shall operate under the normal room temperature and humidity                             |
|   | Warranty Period  | Two Years  |
|   | Should be able to be operated at least at 3 Calibrated Pre-set Speeds  |  |
|   | Should have motor controlled piston movement   |  |
|   | Should have recirculation mode that prevents the loss of reagents during purging by re-directing them into the mounted bottle and facilitates bubble - free dispensing |  |
|   | Should have automatically re-fill function without changing the reading, perform a zero reset (via Tare), switch the instrument off                                    |  |
| <b>The supplier shall provide user training for the operation of equipments listed from Serial no. 1-8 including maintenance and users calibration.</b> |  |  |
| <b>During the warranty period of equipments listed from Serial no. 1-8 supplier must ensure corrective/breakdown maintenance whenever required.</b>     |  |  |

| S.N. | List of items  | Descriptions  |
|------|--|---|
| 9    | <b>Automatic Burette</b>                               | low expansion borosilicate glass with grade/class "A"certificate of quality from the manufacturer. test certificate should be traceable, certificate testing instruments should be mentioned with model no.   |
| 10   | <b>Automatic Burette, amber colored</b>                | low expansion borosilicate glass with grade/class "A"certificate of quality from the manufacturer. test certificate should be traceable, certificate testing instruments should be mentioned with model no.   |
| 11   | <b>Beaker 100, 250, 500 ml</b>                         | low expansion borosilicate glass  |
| 12   | <b>Conical Flask 250 ml wide neck</b>                  | low expansion borosilicate glass  |
| 13   | <b>Funnel 50MM</b>                                     | low expansion borosilicate glass  |
| 14   | <b>Graduated pipette, 1, 2,5 and 10 ml</b>             | Low expansion borosilicate glass with grade "A" certificate of quality. Complete discharge, graduation interval ml: 0.01, Tolerance $\pm$ ml: 0.01, test certificate should traceable, certificate testing instruments should be mentioned with model no. |
| 15   | <b>Burette A Grade ( 25 ml Graduation)</b>             | low expansion borosilicate glass with grade/class "A"certificate of quality from the manufacturer. test certificate should traceable, certificate testing instruments should be mentioned with model no.  |
| 16   | <b>Burette Stand</b>                                   | Rust proof  |
| 17   | <b>Volumetric Flask 50ml, 100 ml, 250ml and 500 ml</b> | low expansion borosilicate glass with grade/class "A"certificate of quality from the manufacturer. test certificate should traceable, certificate testing instruments should be mentioned with model no.  |
| 18   | <b>Volumetric Pipette, 25 ml and 50 ml</b>             | low expansion borosilicate glass with grade/class "A"certificate of quality from the manufacturer. test certificate should traceable, certificate testing instruments should be mentioned with model no.  |
| 19   | <b>Measuring Cylinder 50, 100, 250 and 500 ml</b>      | low expansion borosilicate glass  |
| 20   | <b>Sample Bottle PLB 250 and 500 ml</b>                | Plastic Bottle, Compatible for autoclave for sterilization; wide neck   |
| 21   | <b>Wash Bottle 500ML</b>                               | Plastic Bottle with tip.  |
| 22   | <b>Pipette Stand vertical</b>                          | Plastic Model, Adjustable to 1 ml to 10 ml Pipette.   |
| 23   | <b>Pipette Stand Horizontal</b>                        | Plastic Model, Adjustable to 1 ml to 10 ml Pipette and 10 to 50 Volumetric pipette  |
| 24   | <b>Gloves Nitrile</b>                                  | Must be Nitrile material is 100% Nitrile,Size: Medium,Length: Shall be not less than 300 mm,Expired Date : Should be more than 1 year, Minimum Powder Residue   |
| 25   | <b>Pipette filler three directional</b>                | Plastic model, Having Ejection, Suction and Air release unit  |
| 26   | <b>Ice Box</b>   | Atleast 15 litres. 3 cool packs with cooling solution to each box.  |
| 27   | <b>Reagent Bottle 100,250 ml</b>                       | Amber color, low expansion borosilicate glass, having narrow neck.  |
| 28   | <b>Reagent Bottle 100,250 ml</b>                       | Transparent, low expansion borosilicate glass, having narrow neck.  |
| 29   | <b>Photometer Tube</b>                                 | Glass tube, Compatible with Palintest 7500 Photometer   |
| 30   | <b>Disposable Masks</b>                                | Three layer   |
| 31   | <b>Tissue Paper</b>                                    | 3 ply, Lint free  |
| 32   | <b>pH Buffer 4</b>                                     | 500 ml, calibration standard  |

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|------|---|---|
| 33   | pH Buffer 7                                     | 500 ml, calibration standard  |
| 34   | pH Buffer 10                                    | 500 ml, calibration standard  |
| 35   | Methanol  | Analytical Grade, 500 ml  |
| 36   | Ethanol   | Analytical Grade, 500 ml  |
| 37   | Electrical Conductivity calibration standard    | 1413 $\mu$ S/cm 100 ml  |
| 38   | Turbidity Calibration Standard solution         | 5 NTU, 10 NTU, 100 NTU, 100 ml each   |
| 39   | Glycerol 500 ml                                 | Analytical Grade, 500 ml  |
| 40   | M-lauryl sulphate Broth                         | Analytical Grade, 500 gm  |
| 41   | Membrane Filter without adsorbent Pad           | 0.45 $\mu$ m/47mm   |
| 42   | Conc. Hydrochloric Acid                         | Analytical Grade, 500 ml  |
| 43   | Conc. Nitric Acid                               | Analytical Grade, 500 ml  |
| 44   | Conc. Sulfuric Acid                             | Analytical Grade, 500 ml  |
| 45   | Glacial acetic Acid                             | Analytical Grade, 500 ml  |
| 46   | Zinc standard solution for AAS 100 ml           | Certified Reference Material, must be provided with certificate             |
| 47   | Copper standard solution for AAS 100 ml         | Certified Reference Material, must be provided with certificate             |
| 48   | Arsenic standard solution for AAS 100 ml        | Certified Reference Material, must be provided with certificate             |
| 49   | Aluminium standard solution for AAS 100 ml      | Certified Reference Material, must be provided with certificate             |
| 50   | Fluoride standard solution for AAS 100 ml       | Certified Reference Material, must be provided with certificate             |
| 51   | Sulphate standard solution for AAS 100 ml       | Certified Reference Material, must be provided with certificate             |
| 52   | lead standard solution for AAS 100 ml           | Certified Reference Material, must be provided with certificate             |
| 53   | Calcium standard solution for AAS 100 ml        | Certified Reference Material, must be provided with certificate             |
| 54   | Zirconyl Chloride                               | Analytical Grade, 250gm   |
| 55   | SPADNS  | Analytical Grade, 5 gm  |
| 56   | Nessler Reagent                                 | Analytical grade, 100 ml  |
| 57   | Borosilicates Petriplates small size            | 75 mm diameter  |
| 58   | Distilled Water                                 | 5 ltr   |
| 59   | HPLC grade distilled water                      | 1 ltr   |
| 60   | 0.01N EDTA solution                             | Analytical grade, 500 ml  |
| 61   | 3 tier test tube stand                          | 25mm X 36 tubes, polycarbonate racks  |
| 62   | Portable Vacuum pump (for bacteriological test) | aluminium die cast; 22" Hg vacuum; flow: 15 ltrs/min; 10 mm hose connection |
| 63   | Acetylene Gas with cylinder                     | Atomic Absorption grade acetylene gas, purity :99.6%                        |
| 64   | Acetylene gas refill                            | Atomic Absorption grade acetylene gas, purity :99.6%                        |